

We claim:

1. A biphasic process for the liquid phase epoxidation of an olefinic compound comprising at least one olefinic group to an epoxide by an organic hydroperoxide, using a catalyst comprising chromate or dichromate anions, the process comprising:
 - (i) contacting a liquid mixture containing the olefinic compound and the organic hydroperoxide compound with an aqueous solution of the catalyst in a stirred batch reactor in the presence of water such that the olefinic compound and the organic hydroperoxide are present in non-aqueous organic phase and the catalyst is present in dissolved form in aqueous phase; the mole ratio of organic hydroperoxide to olefinic compound being in the range of 0.1 to 10, the weight ratio of catalyst to olefinic compound being in the range of 0.0005 to 0.5;
 - (ii) separating the aqueous layer containing the catalyst; and
 - (iii) separating the reaction products and unconverted reactants from the non-aqueous organic phase.
2. A process as claimed in claim 1 wherein the contacting in step (i) is carried out at a temperature in the range of 25°C to 250°C and for a contacting period in the range of 0.1h to 100h and at a pressure of at least 1 atm.
3. A process as claimed in claim 1 wherein the reaction products comprise an epoxide of the olefinic organic compound, aldehydes, carboxylic acids, and other organic products produced from the non-selective oxidation of the olefinic compound and also tertiary alcohol produced from the organic hydroperoxide.
4. A process as claimed in claim 1 wherein the olefinic compound is selected from the group consisting of styrene, substituted styrenes, cyclohexene, substituted cyclohexenes, 1-octene and other linear or non-linear normally gaseous and normally liquid olefins, norbornene, cyclopentene, cyclooctene, allylchloride, allyl alcohol and vinyl cyclohexene.
5. A process as claimed in claim 1 wherein the organic hydroperoxide is selected from the group consisting of tertiary butyl hydroperoxide, tertiary amyl hydroperoxide, cumene hydroperoxide, ethyl benzene hydroperoxide, cyclohexyl hydroperoxide and methyl cyclohexyl hydroperoxide.
6. A process as claimed in claim 1 wherein the catalyst is selected from the group consisting of potassium chromate, potassium dichromate, sodium chromate, sodium dichromate, ammonium chromate and ammonium dichromate.

7. A process as claimed in claim 1 wherein the organic hydroperoxide is selected from the group consisting of tertiary butyl hydroperoxide, cumene hydroperoxide and tertiary amyl hydroperoxide.
8. A process as claimed in claim 1 wherein step (i) is carried out at a mole ratio of organic hydroperoxide to olefinic compound of between 0.5 and 2.0.
9. A process as claimed in claim 1 wherein the catalyst is selected from the group consisting of potassium chromate and potassium dichromate.
10. A process as claimed in claim 1 wherein the catalyst to olefinic compound weight ratio during step (i) is between 0.001 and 0.1.
11. A process as claimed in claim 1 wherein step (i) temperature is between 50°C and 150°C and the reaction period is between 1.0 h and 20 h.
12. A process as claimed in claim 1 wherein the olefinic compound is selected from the group consisting of styrene, substituted styrene, cyclohexene, substituted cyclohexene, 1-octene and 1-hexene.
13. A process as claimed in claim 1 wherein the process is carried out in a stirred batch reactor fitted with a reflux condenser to condense the reactants, products and/or water and recycle them back to the process.
14. A process as claimed in claim 1 wherein a reaction pressure above atmospheric pressure is used to enable carrying out the contacting at a temperature higher than the normal boiling point of the reactants and/or solvent, by increasing the boiling point of said reactants and/or solvent with increasing the reaction pressure.
15. A process as claimed in claim 1 wherein the catalyst separated from the reactor and recycled back to the reaction mixture.